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XLI. An Account of the Actinia Sociata, or Clustered Animal-flower, lately found on the Sea-Coasts of the new-ceded Islands : In a Letter from John Ellis, Esquire, F. R. S. to the Right Honourable the Earl of Hillsborough, F. R. S.

My Lord,

Read Nov. 12,
1767.

AMONG the many curious marine animals, which your Lordship has received from the new-ceded islands in the West-Indies, there is one most uncommonly rare : this is of great consequence to natural history, as it seems to bring together two remarkable genera in the system of nature, which Professor Linnæus had removed far from each other.

The one is the Actinia or Animal flower, the other the Hydra or Fresh-water polype.

The Actinia, called by old authors, as Aldrovandus, Johnston, &c. *Urtica marina*, from its supposed property of stinging, is now more properly called by some late English authors the Animal flower. This name seems well adapted to it ; for the claws, or tentacles, being disposed in regular circles, and tinged with a variety of bright lively colours, very nearly represent the beautiful petals of some of our most elegantly fringed and radiated flowers, such as the Carnation, Marygold, and Anemone. As there
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are great variety of species of this animal, so these species differ from each other in their form. The bodies of some of them are hemispherical, others cylindrical, and others shaped like a fig. Their substance likewise differs; for some are stiff and gelatinous, others fleshy and muscular; but they are all capable of altering their shape, when they extend their bodies and claws in search of their food. We find them on our rocky coasts at low water, fixed in the shallows to some solid substance, by a broad base like a sucker; but they can shift their situation, though their movement is very slow.

They have only one opening, which is in the center of the uppermost part of the animal; round this are placed rows of fleshy claws; this opening is the mouth of the animal, and is capable of great extension: it is amazing to see what large shell fish some of them can swallow, such as muscles, crabs, &c. when it has sucked out the fish, it throws back the shells through the same passage. Through this opening it likewise produces its young ones alive, already furnished with little claws; which, as soon as they fix themselves, they begin to extend in search of food.

They are found all round the coasts of England; but the coasts of Sussex and Cornwall furnish us with the greatest varieties of them. The islands in the West Indies are likewise remarkable for many kinds of them, as appear from the different sorts sent to your Lordship by Mr. Greg.

Doctor Gaertner, F. R. S. who has described four species of the English ones in the Phil. Transf. * says

* Vide Phil. Transf. Vol. LII. p. 75. Tab. I. fig. 1, 2, 4, and 5; the animal in fig. 3, in the same Plate is ranked in
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they have the remarkable property of renewing their claws when they are cut off; and ranks them, perhaps very properly, under the genus of Hydra of Linnæus, or Fresh-water polype: which I shall now give a short description of, that we may judge how near your Lordship's new animal approaches to both of these.

The Hydra, or Fresh-water polype, is that extraordinary animal so well known to the curious, from the discoveries of Mr. Abraham Trembley, F. R. S. in its re-production after it had been cut into pieces. When it is extended, it is of a worm-shaped figure, and of the same tender substance with the horns of a common snail.

It adheres by one end like a sucker to water plants and other substances: the other end, which is the head, is surrounded by many arms or feelers placed like rays round a center: this center is its mouth, and with these arms, which are capable of great extension, it seizes small worms and water insects, and brings them to its mouth; often swallowing bodies larger than itself: when the food is digested in the stomach, it returns the remains of the animals it feeds on, through its mouth again, having no other visible passage from its body.

Their manner of multiplying is from eggs, which they produce in autumn*; but the most common is from their sides, in which there first appear small knobs, or papillæ; as these increase in length, little

this genus by Doctor Pallas, as well as Doctor Gaertner, but very improperly, as it has many feet, and a passage through its body. Doctor Linnæus calls it *Holothuria*.

* See Pallas, *Zoophyt.* p. 28.

fibres

fibres are seen rising out of the circumference of their heads, which they soon use to procure food. When they are thus arrived at a mature state, they send forth other young ones from their sides: so that though many of them soon fall off, and provide for themselves, yet the animal frequently branches out into a numerous offspring, growing out of one common parent, each of which not only procures nourishment for itself, but for the whole family.

I come now to your Lordship's new animal; and, for the Satisfaction of the Royal Society, lay before them one of your Lordship's specimens preserved in spirits, with a dissection of one of them, to shew its internal structure, together with three species of *Actinia*, or Animal flowers, sent to your Lordship from the new-ceded islands.

This compound animal, which is of a tender fleshy substance, consists of many tubular bodies, swelling gently towards the upper part, and ending like a bulb, or very small onion; on the top of each is its mouth, surrounded by one or two rows of tentacles, or claws, which when contracted look like circles of beads.

The lower part of all these bodies have a communication with a firm fleshy wrinkled tube, which sticks fast to the rocks, and sends forth other fleshy tubes, which creep along them in various directions. These are full of different sizes of these remarkable animals, which rise up irregularly in groupes near to one another.

This adhering tube, that secures them fast to the rock, or shelly bottom, is worthy of our notice. The knobs that we observe, are formed in several
parts

parts of it, by its insinuating itself into the inequalities of the coral rock, or by grasping pieces of shells, part of which still remain in it, with the fleshy substance grown over them.

This shews us the instinct of nature, that directs these animals to preserve themselves from the violence of the waves, not unlike the anchoring of muscles, by their fine silken filaments, that end in suckers; or rather like the shelly bases of the Serpula, or Worm-shell, the Tree Oyster, and the Slipper Barnicle, &c. whose bases conform to the shape of whatever substance they fix themselves to, grasping it fast with their testaceous claws, to withstand the fury of a storm.

When we view the inside of this animal dissected lengthways, we find a little tube like a gullet leading from the mouth to the stomach, from whence there rise eight wrinkled small guts, in a circular order, with a yellowish soft substance in them; these bend over in the form of arches towards the lower part of the bulb, from whence they may be traced downwards, to the narrow part of the upright tube, till they come to the fleshy adhering tube, where some of them may be perceived entering into a papilla, or the beginning of an animal of the like kind, most probably to convey it nourishment, till it is provided with claws: the remaining part of these slender guts are continued on in the fleshy tube, without doubt for the same purpose of producing and supporting more young ones from the same common parent.

The many longitudinal fibres, that we discover lying parallel to each other, on the inside of the
semi-

femi-transparent skin, are all inserted in the several claws round the animal's mouth, and are plainly the tendons of the muscles, for moving and directing the claws, at the will of the animal ; these may be likewise traced down to the adhering tube.

As this specimen has been preserved in spirits, the colour of the animal when living cannot certainly be known ; it is at present of a pale yellowish brown.

With regard to its name, it may be called *Actinia sociata*, or the Cluster animal flower.

Among the critics, my Lord, I am aware of this ; that it may be said, that an animal compounded of many animals has not a very philosophical sound. But it is well known to those, who understand the nature of zoophytes ; that there are many kinds of these animals, as well such as swim about freely, as such as are fixt to rocks and shells in the sea, that have a great many mouths in the form of polypes, and yet are but single animals ; such as the great variety of *Pennatulas*, or Sea pens, among those that swim about, and most of the *Sertularias*, *Gorgonias*, with many others, among those that are fixt. Yet this new animal of your Lordship's differs very much from the generality of these. I think I may compare it, to speak in the style of those who maintain that zoophytes vegetate, to a timber tree, that sends out at a distance round it many suckers from its roots, which suckers coming in time to be trees, these may and will, with propriety, be reckoned so many distinct trees, though connected at their roots with the parent tree, and that without any absurdity.

Left any doubt should still arise in this abstruse part of the operations of nature, it may be proper that I should explain myself further, by shewing that there are a great many zoophytes, which were formerly called Corallines, now Sertularias and Cellularias, that from a creeping adhering tube send up several single animals, others send up several branched animals. To give an instance or two of each, I shall mention the *Sertularia uniflora*, or Single bell-shaped Coralline (see the Essay on Corallines, Pl. XIV. fig. A and B) and the *Cellularia anguina*, or Snake's head coralline (see the same Essay, Pl. XXII. fig. C) both which, like our *Actinia fociata*, send up distinct animals with one mouth each.

Whereas the *Sertularia pumila*, or Sea oak coralline (see Essay on Coralline, Pl. V. fig. A) and the *Cellularia bursaria*, or Shepherd purse coralline (see the same Essay, Pl. XX. fig. A) send out animals, in the form of spikes or branches, that have many mouths from their own creeping and adhering tubes; and yet both those with one mouth to each, and these with many, I esteem as so many distinct animals, notwithstanding their being connected by an adhering tube, as I have said in the instance of the tree and its suckers.

To conclude, my Lord, the importance of the discovery of this new animal to natural history is this, that it clears up that much-disputed point, which is, that the extension or increase of the substance of these zoophytes is of an animal, and not of a vegetable growth (as some late authors would have us think) by thus making the fact more clear and evident to our senses.

For the poetical descriptions of some late systematical authors have tended rather to confuse than explain these matters to our ideas ; for instance, they call these bodies, that rise up like a spike with many mouths, a vegetating stem, and their mouths, which are formed like so many polypes, flowers ; though with these supposed flowers, they evidently seize their food, by stretching out their claws (which they call the petals) to convey it to their mouths, that are in the center of each, to swallow it, digest it, and return the non-nutritive parts back again by the same way. Can this then be called a vegetative life ?

But happily this animal of your Lordship's is large enough for dissection ; and in that state discovers to us, not only muscles and tendons, but a stomach to digest, and intestines to secrete, proper nourishment for the support and increase of itself and its progeny ; which I am persuaded is the strongest proof that has yet appeared to convince the learned world, that zoophytes are true animals, and in no part vegetable ; and that the Royal Society are highly obliged to your Lordship for this most valuable acquisition in natural history, as well as he who has the honour to be,

My Lord,

Your Lordship's most devoted,

and much obliged humble servant

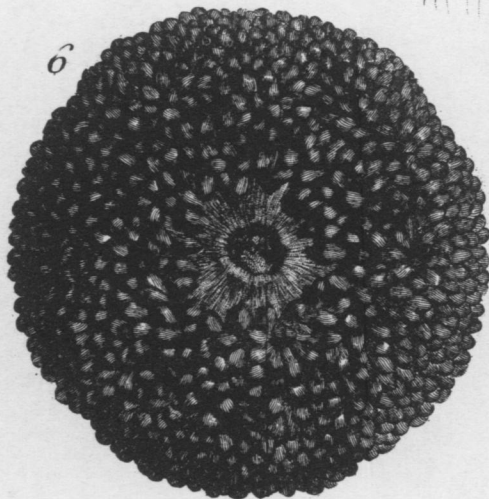
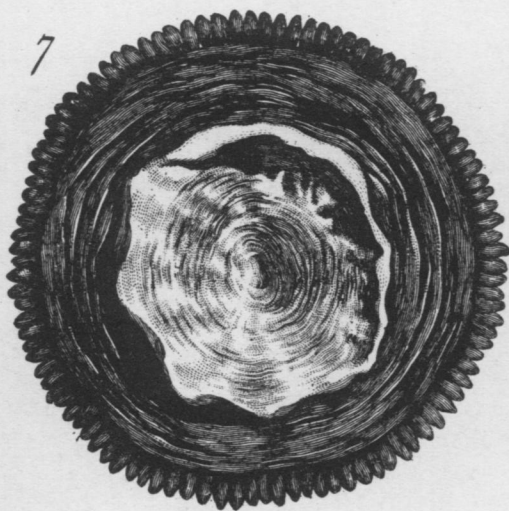
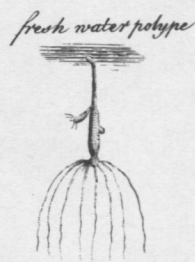
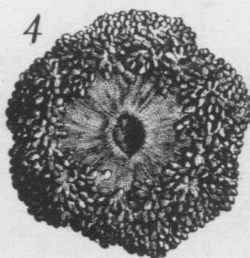
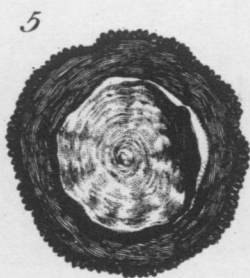
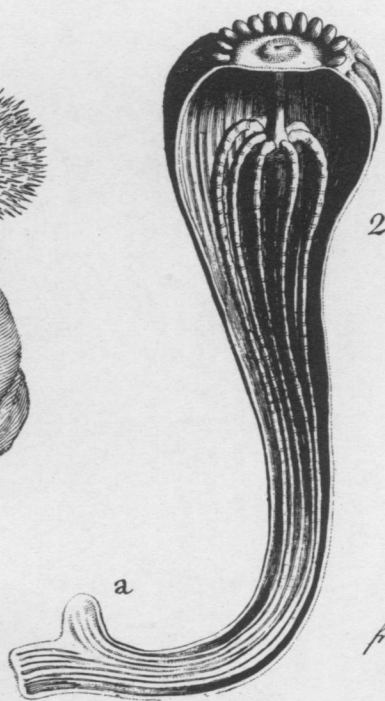
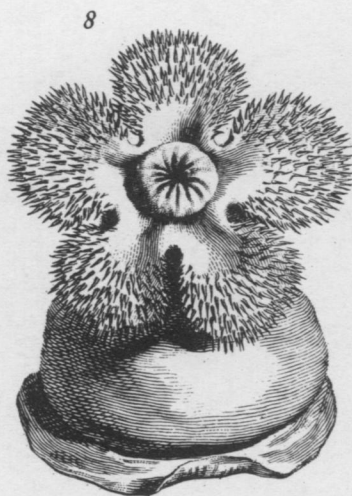
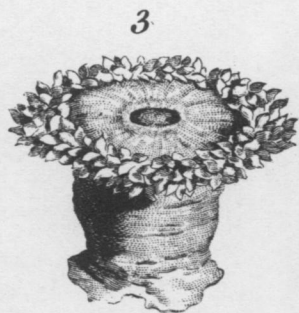
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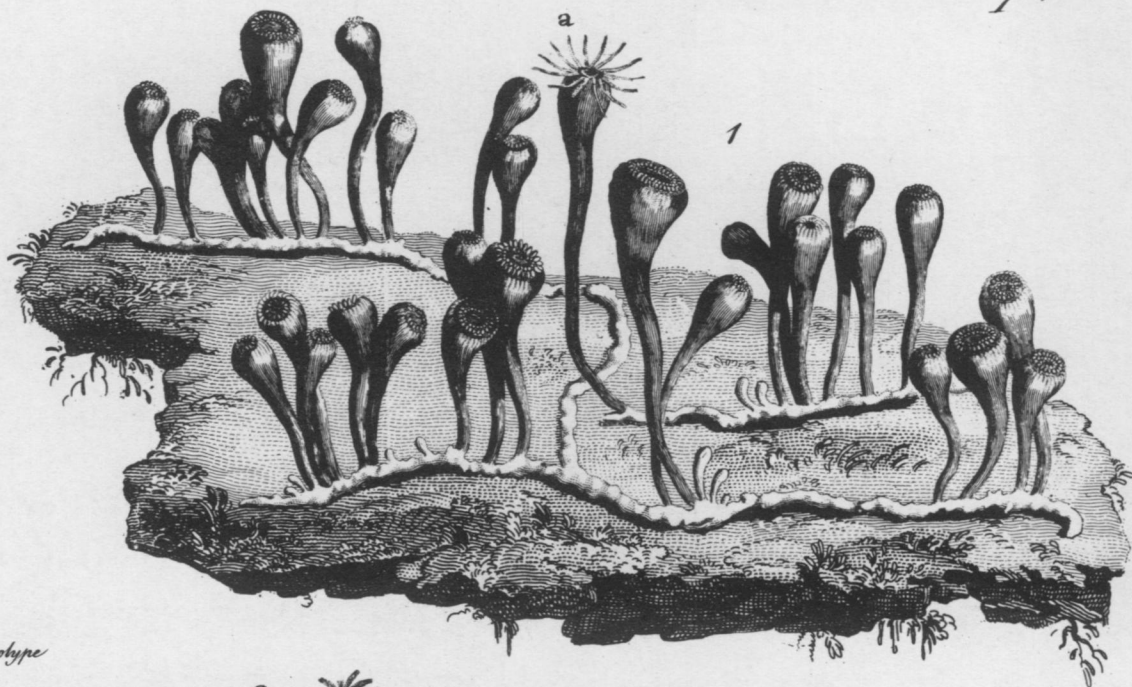
John Ellis.

The Description of Plate XIX.

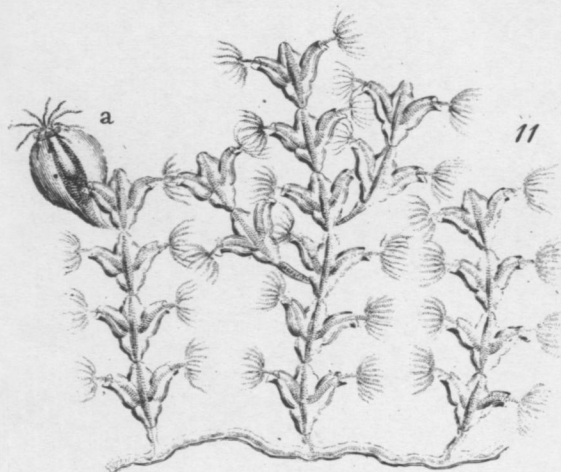
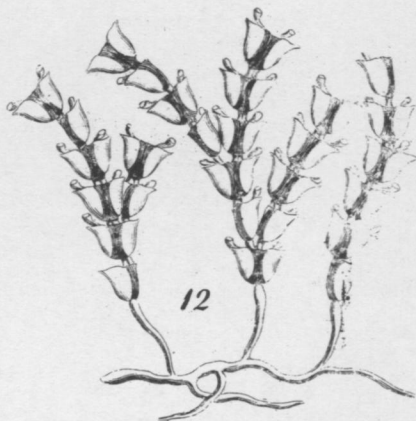
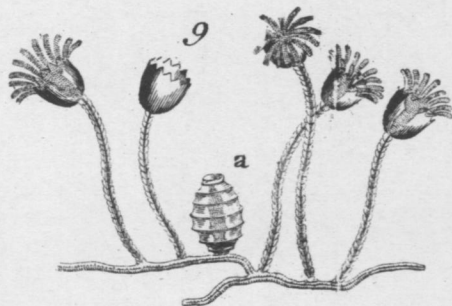
- Fig. 1. The *Actinia sociata*, or Clustered animal flower, with its radical tube adhering to a rock. (*a*) One of the animals stretching out its claws.
2. A perpendicular dissection of one of these bodies, to shew the gullet, intestines, stomach, and fibres, or tendons, that move the claws. (*a*) A young one arising out of the adhering tube.
3. The *Actinia aster*, or Sea star flower, from the new ceded Islands.
4. The *Actinia anemone*, or Sea anemone, from the same place.
5. The under part of the same, by which it adheres to rocks.
6. The *Actinia helianthus*, or Sea sun-flower, from the same place.
7. The under part of the same.
8. The *Actinia dianthus*, or Sea carnation, from the rocks at Hastings in Sussex: this animal adheres by its tail, or sucker, to the under part of the projecting rocks, opposite to the town; and, when the tide is out, has the appearance of a long white fig: this is the form of it when it is put into a glass of sea-water. It is introduced here as a new variety of this animal, not yet described.

9. The





sh water polype



- Fig. 9. The *Sertularia uniflora*, or Single bell-shaped coralline magnified. (*a*) One of its ovaries.
10. The *Cellularia anguina*, or Snake's-head coralline, magnified.
11. The *Sertularia pumila*, or Sea-oak coralline, magnified. (*a*) One of its ovaries.
12. The *Cellularia bursaria*, or Shepherd's purse coralline, magnified.